

Illinois Department of Public Health

Prevention & Control

Biting Bugs Or Something Else?

Parasitosis is the condition of being parasitized, bitten or lived on by organisms commonly referred to as bugs, worms, mites, etc. Recognizing this condition is not always easy, and diagnosing the true source of what are thought to be bites can be a long and frustrating process. The information below can help with diagnosis.

What could be biting me?

Please note the following discusses only species inhabiting Illinois. For additional information, refer to the fact sheets listed below. Note also that stinging pests (bees and wasps) not discussed here but are covered in one of the Department's fact sheets. **The fact sheets referred to below can be found on the Illinois Department of Public Health website.** Select the appropriate letter from the A-to-Z list, such as "B" to find the *Bees and Wasps* fact sheet.

NON-PARASITIC ARTHROPODS

Arthropods are animals with jointed appendages and shell-like exoskeletons. Included are creatures often called bugs, such as insects, spiders, mites and ticks, some of which can bite people. Some are venomous, but the bites of only a few species (e.g., various parasitic insects, mites and ticks) pose a health concern, and fewer still are considered dangerous (such as widow spiders). The non-parasitic arthropods listed below are those that may bite but do so in self-defense or when probing for food or moisture. Their bites rarely leave more than a red bump on the skin and they are not generally considered threats to human health.

Insects: *minute pirate bugs, thrips, psocids, etc.*

Most insect bites are not particularly painful and leave no mark. However, in late summer, small insects known as **minute pirate bugs** (*Orius* spp.) render painful bites that seem out of proportion to the insects' size. These tiny bugs (about 1/8-inch long) are flat and black with lighter markings on their backs. Most are predators that feed on insect eggs and small insects.



Minute Pirate Bug

Thrips (Thysanoptera) are also tiny (about 1/8 inch long) insects whose bites can feel like painful pinpricks. Some are wingless, others have feathery wings. Thrips feed on plants. In mid-summer, large numbers can be carried by wind, sometimes through open doors and windows and into structures, into swimming pools, and onto people.

Psocids (Psocoptera) are about the same size as thrips. They can occur in large numbers especially where there is high humidity. Most psocids ("so-sids") found indoors are wingless and

known as booklice because they are often found among books and papers where they feed on mold. They are also found in plant material including stored grain, animal nests, and in furnishings made of plant fibers. Psocids can inflict pinprick bites, but do not suck blood or transmit disease to humans.

A greater health threat is posed by various moth species whose larvae (caterpillars) can sting. Most caterpillars are harmless, but **stinging caterpillars** have stiff hairs that, when touched, can penetrate skin and inject toxins producing a rash, redness, burning and swelling. These symptoms usually disappear in a few days, but if the stinging hairs contact a person's eyes, blindness can result. Some stinging caterpillars are brightly colored -- as a warning not to touch them -- but others are drab. These caterpillars are rarely numerous, so encounters with them are uncommon.



Saddleback Caterpillar

Centipedes: *house centipedes*

Most centipedes are found outdoors and are harmless. However, the **house centipede** (*Scutigera coleoptrata*) occurs indoors and has a venomous bite. Bites are uncommon but may be painful, though no more serious than a mosquito bite or bee sting. House centipedes are gray-brown in color and up to 1.5 inches long with 15 pairs of long legs. Unlike many centipedes, house centipedes are fast runners. They inhabit moist areas such as basements, crawlspaces and bathrooms, where they feed on small insects and spiders.

Spiders: *various species*

Many spiders can bite, but only the **widow spiders** (*Latrodectus* spp.) and members of the brown spider family (Sicariidae) including the **brown recluse** (*Loxosceles reclusa*), are considered dangerous. Spider bites of any type are uncommon. Red marks and skin lesions are often misdiagnosed as spider bites even when no spider was seen, captured or properly identified.

Information on spiders can be found in the Department's fact sheets, *Spiders*, and *Brown Recluse and Black Widow Spiders*.

Mites (non-parasitic species): *grain mites, cheese mites, storage mites*

There are many different kinds of mites in our environment, and the vast majority are harmless to humans. Some, such as follicle mites (*Demodex* spp.), are probably living on your face right now, not causing you any harm (at least not before you learned this). A few types of mites bite humans, cause allergic reactions, and/or are parasitic.

Information on mites can be found in the Department's fact sheet, *Mites Affecting Humans*.



PARASITIC ARTHROPODS

Most arthropod parasites of humans bite to feed on blood. A person's health can be threatened when parasitized by large numbers of parasites, due to blood loss and allergic reactions. But the greatest danger from blood-sucking parasites (e.g., mosquitoes and ticks) is usually disease transmission.

Insects (parasitic species): fleas, lice, bed bugs, mosquitoes and various biting flies

Information on biting pests can be found in the following Department fact sheets: *Fleas, Head Lice, Crab or Pubic Lice, Mosquitoes, Biting Flies, and Bed Bugs*.

Ticks: American dog tick, lone star tick, black-legged (deer) tick, brown dog tick, soft ticks

Information on ticks can be found in the Department fact sheet, *Common Ticks*.

Mites (parasitic species): scabies mites, harvest mites (chiggers), itch mites, rodent and bird mites

Information on these mites can be found in the Department fact sheet, *Mites Affecting Humans and Scabies*.

MYSTERY BITES: When not everything that feels or looks like a bite is really a bite

From the list of biting pests and parasites one might conclude that an endless number of biting bugs is out there waiting to pounce on us, and that being bitten or parasitized by one or more of them is common, if not inevitable. Conclusions such as this, however, are often based more on incomplete knowledge, misunderstanding, or emotion rather than on scientific fact or real evidence. So it is that most people who believe they are bitten or are being infested by bugs, have drawn the wrong conclusion. An unfortunate few hold fast to this conclusion despite evidence to the contrary. The following questions and answers can help persons find the facts as to what may or may not be biting them.

Q. How can I catch a specimen to help with diagnosis?

Biting pests found indoors are small, usually less than 1/4-inch long, but are rarely microscopic and never "invisible." Their small size can make them difficult to capture, and it can be difficult to catch them in the act of biting. Feeling pinprick-like sensations on your skin and seeing nothing there is typical of *other* causes and conditions, not of biting pests. *Immediately* applying the adhesive side of clear tape to spots where you feel biting sensations may help capture biting pests such as thrips, psocids, or rodent and bird mites that can be difficult to see. Examine the tape with a magnifying lens to see if a pest is present and, if so, present the specimen to a specialist for identification. Note, however, that tape may damage specimens and make them difficult to identify. Another method of capturing tiny arthropods is to dip the tip of a small artist's paintbrush in ethanol or rubbing alcohol, and then touch the brush to the specimen. The specimen will adhere to the paintbrush and can be deposited in a small bottle of alcohol by dipping the brush into the bottle. Specimens collected in alcohol should be sealed inside plastic bags to help prevent leakage, and shipped in containers that seal tightly.

NOTE: The Illinois Department of Public Health, Environmental Health Division, will identify specimens sent by Illinois residents. There is no charge for this service. Specimens should be placed in a container such as a small box so they will not be crushed in the mail. If you send specimens to the Department for identification, please complete and include this form: <http://www.idph.state.il.us/forms/ohp/ArthropodSpecimenForm.pdf>.

Insect monitors, or sticky traps, also can be used to capture specimens. These traps are simply cardboard with an adhesive surface that traps insects, spiders, etc., when they walk onto the sticky surface. When properly placed and replaced, sticky traps can be excellent for monitoring and pinpointing infestations. The traps can be purchased in the home, lawn and garden sections of some stores, also from do-it-yourself pest control retail stores, some pest control companies and distributors, and through the Internet. The traps are usually placed on the floor in areas of suspected activity. The more traps used the better the chance of capturing pests that may be present. Most can be folded to help prevent dust, dirt and other contaminants from covering the adhesive. Replace them when they lose their stickiness or become full of insects, spiders, etc. If you or your pest control technician find something you believe may be a biting pest, you can package the trap in a box so it will not be smashed in the mail, and send it to a qualified individual for identification.

Specimens of some biting pests, such as scabies mites, cannot be obtained in the ways listed above. Diagnosing scabies usually requires the attention of a physician.

For information on selecting a pest control company, see the Department fact sheet, *Pest Control: Do it Yourself or Hire a Professional?* at: <http://www.idph.state.il.us/envhealth/pcepestcntrl.htm>.

Q. When should pesticides be used?

Pesticides may be necessary to control some biting pests and parasites, such as bed bugs, but *pesticides should NOT be applied unless a pest has been identified* by a qualified specialist. Applying pesticides without first confirming that a particular pest is present may be considered a violation of pesticide regulations. Before applying, the presence of the pest should be confirmed, it should be accurately identified, *and* the pest should be one that pesticides can effectively control. Pesticide sprays and aerosol fogs are virtually useless and can be harmful when applied indoors to control certain biting pests such as lice, scabies mites, chiggers and certain other pests.

Similarly, it is inadvisable to use pesticide-containing creams and shampoos designed to control lice or scabies, until these pests are diagnosed and the medications prescribed by a physician. As with pesticide application, excessive use of louse and mite creams and shampoos can be more detrimental to one's health than the biting pests thought to be present. Likewise, it is rarely beneficial to discard items *thought* to be infested, before a pest is discovered and identified. Even when pests such as bed bugs are found, throwing away clothing, carpeting, mattresses, beds and other furniture is usually unnecessary – and costly.

Q. If the problem is not a bug, what is it?

Now and then everyone experiences *paresthesia* – a prickly, tingling or creeping sensation on the skin. There are many explanations for these sensations. Perhaps biting pests are involved, but it is more likely that something else caused the sensation you assumed was caused by a

bug. Where no organism is found, bugs are probably not the cause of what you felt. The sensations may well be real, but something else is causing them.

In addition to biting bugs, pinprick sensations and itches can be caused by **sensitivity** to small particles such as paper fibers and insulation, sensitivity to certain fabrics, static electricity and dry skin, **allergic reactions** to many products including detergents, disinfectants, cosmetics, lotions, soaps and shampoos, foods, as well as organic materials including dander and the microscopic fragments and feces of animals such as pets, rodents, and insects including cockroaches. **Reactions to drugs** (prescription, over-the-counter and illegal) and a long list of **medical conditions** ranging from dry skin to skin cancer, as well as psychological disorders, should not be disregarded as possible causes.

If you believe you are being bitten or parasitized, the first step is to obtain a specimen for identification (see above). If no specimen is found and, after consulting pest control professionals, entomologists, health care professionals, family physicians and/or dermatologists, there is still no evidence of a pest capable of causing your sensations, it is time to consider that what you are experiencing may be imaginary.

Q. Can bites be imaginary?

Those who imagine they are being bitten or parasitized by bugs are usually not suffering from a phobia or *fear* of insects (known as *entomophobia*). Nor are they suffering from an “unidentified skin parasite infection” referenced on Internet pages but not recognized as real by medical professionals. Obviously, if the supposed parasite cannot be found and identified, one cannot assume that a bug or parasite exists.

One surprisingly common condition is *delusory parasitosis* (DP). Persons with this disorder believe that organisms are infesting, attacking or parasitizing their bodies. Their perception of being parasitized is a false belief, or delusion. Yet it is very real to them.

Persons suffering from delusory parasitosis truly believe they are being parasitized. Their belief may have been initiated by a real stimulus, such as a prickly sensation caused by one of the conditions mentioned above. Sufferers often have experienced recent stress or emotional trauma.

Some persons with DP often contend that the bugs attacking them are too small to be seen. Others will describe their bugs' appearance and behavior with statements that an entomologist or other professional familiar with biting pests and parasites, knows cannot be true. Actual DP sufferers have described bugs that flash lights of different colors, bugs that cluster together in geometric designs on the wall, and bugs that live in bathwater during one stage of their life cycle and in another stage inhabit dead bats. These, of course, are delusions, and their underlying cause can be diagnosed and treated by physicians familiar with such disorders.

While the real world of arthropods and parasites includes some truly amazing creatures with bizarre behaviors, an entomologist trained in this specialty knows what can and cannot be true. Incredible stories, along with being unable to obtain definitive specimens from the household, can lead to a diagnosis of delusory parasitosis.

In many cases DP causes one to take extreme measures to rid oneself of imaginary parasites. The sufferer will discard or even burn furniture, carpeting and other items believed to be

infested, or move to a new residence. Afflicted persons often over-apply pesticides, use them or other harsh chemicals on their skin, and damage their skin by scratching in failed attempts to kill or extract non-existent bugs. A person may continue to seek specialists who can identify pests, submitting numerous samples from vacuum cleaner bags, adhesive tape, skin scrapings, etc., hoping *someone* will at last confirm their suspicions. The afflicted person's insistence occurs despite advice from persons including qualified professionals who conclude that no pest or parasite is involved. Again, if everyone concludes that nothing is there, logic dictates that nothing is there.

Sometimes the DP sufferer's belief is so unshakable that relatives and friends, rather than disagreeing with the person, placate the afflicted, reinforcing their belief. In some cases persons close to the sufferer actually begin to believe that they too are being parasitized (a condition known as *Bell's syndrome*), further reinforcing the sufferer's belief. Even the family physician may examine the person and prescribe pesticidal creams or other medications that are not only unnecessary but may reinforce the DP sufferer's delusion.

Unfortunately the DP sufferer's refusal to accept that their "bugs" are imaginary often prevents them from getting the help they need from physicians or psychologists familiar with delusory parasitosis and its treatment. This is unfortunate because the disease can be managed or eliminated through stress relief and in combination with medication.

Q. What else can I do?

Here are some suggestions:

- * Vacuum and dust the premises thoroughly. Vacuum cleaners with HEPA (High-Efficiency Particulate Air) filters are most effective in preventing recirculation of allergens during cleaning.
- * Clean office equipment, such as paper handling machinery.
- * Change or clean air filters in air handling units monthly. Consider replacing standard fiberglass filters with electrostatic filters.
- * Experiment by discontinuing use of your current brand of laundry detergent, dishwashing soap, air fresheners, cosmetics, soaps, shampoos, perfumes or other personal care products, especially those you began using just before the problem developed.
- * Consult your doctor about possible allergies, reactions to medications, and other medical conditions that might cause skin reactions.
- * Reduce mold and mildew by installing a vapor barrier and vents in crawlspaces, installing a dehumidifier and/or air conditioning in damp rooms. Correct plumbing leaks and condensation problems. Use a humidifier when living spaces become too dry.
- * Eliminate rodent and bird infestations and nests in or on the structure.
- * Consult with an entomologist or pest control professional regarding identification of suspected pests.
- * Have pets checked by a veterinarian for possible infestations of parasites.
- * Do not be afraid to see a physician. If you are diagnosed with DP, you can receive treatment and the problem can be solved. Above all, keep an open mind about the source of the problem. After all, you are reading this because solving the problem is your goal, so take every opportunity to do so.

NOTE: When pesticides are used, it is the applicator's legal responsibility to read and follow directions on the product label. Not following label directions, even if they conflict with information provided herein, is a violation of federal law.

For more information, contact the Illinois Department of Public Health, Division of Environmental Health, 525 W. Jefferson St., Springfield, IL 62761, 217-782-5830, TTY (hearing impaired use only) 800-547-0466.